

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 2

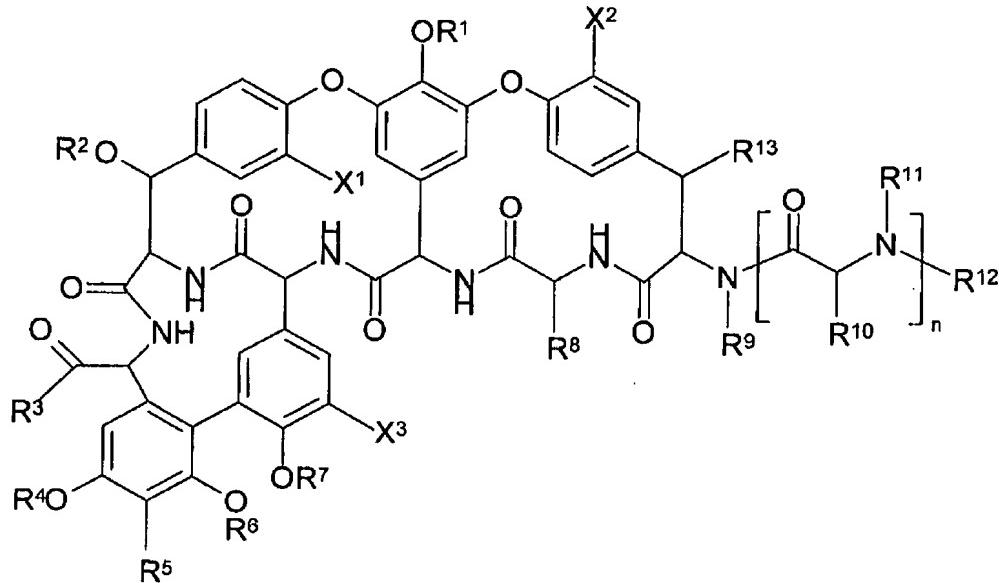
In the Claims:

Please amend Claims 2, 3, 4, 5, 19, 28, 29 and 31 to read as follows (claims not being amended in this response are restated below for the convenience of the Examiner):

1. (Restated) A glycopeptide substituted with one or more substituents each comprising one or more phosphono groups; or a pharmaceutically acceptable salt, or stereoisomer, or prodrug thereof.
2. (Amended) A glycopeptide comprising a carboxy-terminus, wherein the glycopeptide is substituted at the carboxy-terminus with a substituent comprising one or two phosphono groups.
3. (Amended) A glycopeptide comprising a 1,3-dihydroxyphenyl moiety, wherein the glycopeptide is substituted at the 2-position of the 1,3-dihydroxyphenyl moiety with a substituent comprising one or two phosphono groups.
4. (Amended) The glycopeptide of claim 3, wherein the substituent is N-(phosphonomethyl)aminomethyl; N-(2-hydroxy-2-phosphonoethyl)aminomethyl; N-carboxymethyl-N-(phosphonomethyl)aminomethyl; N,N-bis(phosphonomethyl)aminomethyl; or N-(3-phosphonopropyl)aminomethyl.

U.S. Serial No. 09/847,042
 Attorney Docket No. P-088-R
 Page 3

5. (Amended) A glycopeptide of formula I:



wherein:

R^1 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl, heterocyclic and $-R^a-Y-R^b-(Z)_x$; or R^1 is a saccharide group optionally substituted with $-R^a-Y-R^b-(Z)_x$, R^f , $-C(O)R^f$, or $-C(O)-R^a-Y-R^b-(Z)_x$;

R^2 is hydrogen or a saccharide group optionally substituted with $-R^a-Y-R^b-(Z)_x$, R^f , $-C(O)R^f$, or $-C(O)-R^a-Y-R^b-(Z)_x$;

R^3 is $-OR^c$, $-NR^cR^c$, $-O-R^a-Y-R^b-(Z)_x$, $-NR^c-R^a-Y-R^b-(Z)_x$, $-NR^cR^c$, or $-O-R^c$; or R^3 is a nitrogen-linked, oxygen-linked, or sulfur-linked substituent that comprises one or more phosphono groups;

R^4 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, $-R^a-Y-R^b-(Z)_x$, $-C(O)R^d$ and a saccharide group optionally substituted with $-R^a-Y-R^b-(Z)_x$, R^f , $-C(O)R^f$, or $-C(O)-R^a-Y-R^b-(Z)_x$, or R^4 and R^5 can be joined, together with the atoms to which they are attached, to form a

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 4

heterocyclic ring optionally substituted with $-NR^c-R^a-Y-R^b-(Z)_x$;

R^5 is selected from the group consisting of hydrogen, halo, $-CH(R^c)-NR^cR^c$, $-CH(R^c)-NR^cR^c$, $-CH(R^c)-NR^c-R^a-Y-R^b-(Z)_x$, $-CH(R^c)-R^a$, $-CH(R^c)-NR^c-R^a-C(=O)-R^a$, and a substituent that comprises one or more phosphono groups;

R^6 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, $-R^a-Y-R^b-(Z)_x$, $-C(O)R^d$ and a saccharide group optionally substituted with $-R^a-Y-R^b-(Z)_x$, R^f , $-C(O)R^f$, or $-C(O)-R^a-Y-R^b-(Z)_x$, or R^5 and R^6 can be joined, together with the atoms to which they are attached, to form a heterocyclic ring optionally substituted with $-NR^c-R^a-Y-R^b-(Z)_x$;

R^7 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, $-R^a-Y-R^b-(Z)_x$, and $-C(O)R^d$;

R^8 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl and heterocyclic;

R^9 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl and heterocyclic;

R^{10} is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl and heterocyclic; or R^8 and R^{10} are joined to form $-Ar^1-O-Ar^2-$, where Ar^1 and Ar^2 are independently arylene or heteroarylene;

R^{11} is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl and heterocyclic, or R^{10} and R^{11} are joined, together with the carbon and nitrogen atoms to which they are attached, to form a heterocyclic ring;

R^{12} is selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl,

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 5

cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl, heterocyclic, $-C(O)R^d$, $-C(NH)R^d$, $-C(O)NR^cR^c$, $-C(O)OR^d$, $-C(NH)NR^cR^c$, $-R^a-Y-R^b-(Z)_x$, and $-C(O)-R^a-Y-R^b-(Z)_x$, or R^{11} and R^{12} are joined, together with the nitrogen atom to which they are attached, to form a heterocyclic ring;

R^{13} is selected from the group consisting of hydrogen or $-OR^{14}$;

R^{14} is selected from hydrogen, $-C(O)R^d$ and a saccharide group;

each R^a is independently selected from the group consisting of alkylene, substituted alkylene, alkenylene, substituted alkenylene, alkynylene and substituted alkynylene;

each R^b is independently selected from the group consisting of a covalent bond, alkylene, substituted alkylene, alkenylene, substituted alkenylene, alkynylene and substituted alkynylene, provided R^b is not a covalent bond when Z is hydrogen;

each R^c is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl, heterocyclic and $-C(O)R^d$;

each R^d is independently selected from the group consisting of alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl and heterocyclic;

R^e is a saccharide group;

each R^f is independently alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl, aryl, heteroaryl, or heterocyclic;

R^x is an N-linked amino saccharide or an N-linked heterocycle;

X^1 , X^2 and X^3 are independently selected from hydrogen or chloro;

each Y is independently selected from the group consisting of oxygen, sulfur, $-S-S-$, $-NR^c-$, $-S(O)-$, $-SO_2-$, $-NR^cC(O)-$, $-OSO_2-$, $-OC(O)-$, $-NR^cSO_2-$, $-C(O)NR^c-$, $-C(O)O-$, $-SO_2NR^c-$, $-SO_2O-$, $-P(O)(OR^c)O-$, $-P(O)(OR^c)NR^c-$, $-OP(O)(OR^c)O-$, $-OP(O)(OR^c)NR^c-$, $-OC(O)O-$, $-NR^cC(O)O-$, $-NR^cC(O)NR^c-$, $-OC(O)NR^c-$, $-C(=O)-$, and $-NR^cSO_2NR^c-$;

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 6

each Z is independently selected from hydrogen, aryl, cycloalkyl, cycloalkenyl, heteroaryl and heterocyclic;

n is 0, 1 or 2; and

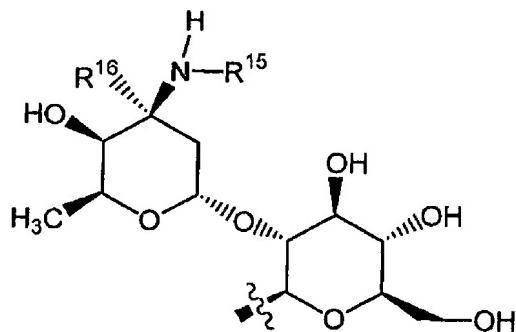
x is 1 or 2;

or a pharmaceutically acceptable salt, stereoisomer, or prodrug thereof;

provided at least one of R^3 and R^5 is a substituent comprising one or more phosphono groups.

6. (Restated) The glycopeptide of claim 5 wherein R^1 is a saccharide group optionally substituted with $-R^a-Y-R^b-(Z)_x$, R^f , $-C(O)R^f$, or $-C(O)-R^a-Y-R^b-(Z)$.

7. (Restated) The glycopeptide of claim 5 wherein R^1 is a saccharide group of the formula:



wherein R^{15} is $-R^a-Y-R^b-(Z)_x$, R^f , $-C(O)R^f$, or $-C(O)-R^a-Y-R^b-(Z)_x$; and R^{16} is hydrogen or methyl.

8. (Restated) The glycopeptide of claim 6 wherein R^2 , R^4 , R^6 , and R^7 are each hydrogen.

9. (Restated) The glycopeptide of claim 8 wherein R^3 is $-OH$.

10. (Restated) The glycopeptide of claim 8 wherein R^3 is a nitrogen-linked, oxygen-

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 7

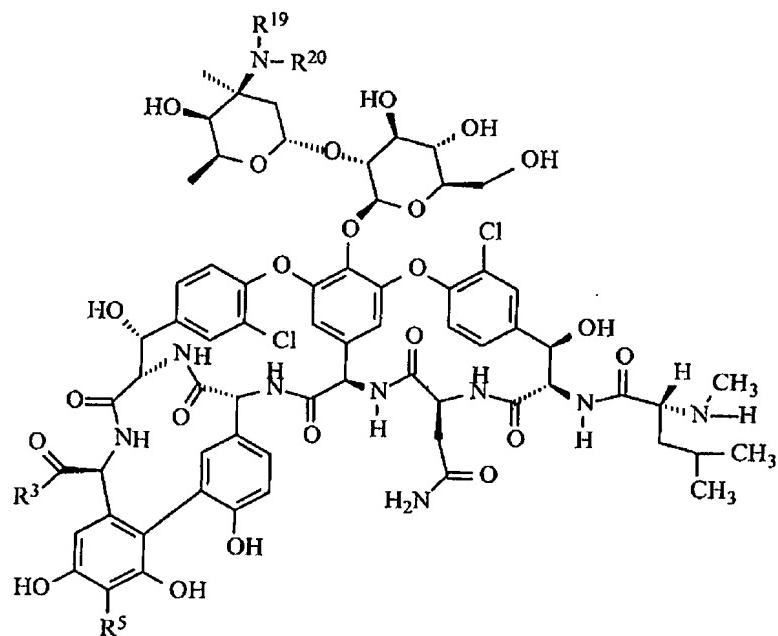
linked, or sulfur-linked substituent that comprises one or more phosphono groups.

11. (Restated) The glycopeptide of claim 10 wherein R³ is a group of the formula -O-R^a-P(O)(OH)₂, -S-R^a-P(O)(OH)₂, or -NR^c-R^a-P(O)(OH)₂.

12. (Restated) The glycopeptide of claim 8 wherein R⁵ is a group of the formula -CH(R²¹)-N(R^c)-R^a-P(O)(OH)₂; wherein R²¹ is hydrogen or R^d.

13. (Restated) The glycopeptide of claim 12 wherein R⁵ is -CH₂NH-R^a-P(O)(OH)₂.

14. (Restated) The glycopeptide of claim 5 which is a compound of formula II:



(II)

wherein:

R¹⁹ is hydrogen;

R²⁰ is -R^a-Y-R^b-(Z)_x, R^f, -C(O)R^f, or -C(O)-R^a-Y-R^b-(Z)_x; and

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 8

R^a, Y, R^b, Z, x, R^f, R³, and R⁵ have the values defined in claim 5;
or a pharmaceutically acceptable salt, or stereoisomer, or prodrug thereof;
provided at least one of R³ and R⁵ is a substituent comprising one or more phosphono groups.

15. (Restated) The glycopeptide of claim 14 wherein R³ is -OH.

16. (Restated) The glycopeptide of claim 14 wherein R³ is a nitrogen-linked, oxygen-linked, or sulfur-linked substituent that comprises one or more phosphono groups.

17. (Restated) The glycopeptide of claim 14 wherein R³ is a group of the formula -O-R^a-P(O)(OH)₂, -S-R^a-P(O)(OH)₂, or -NR^c-R^a-P(O)(OH)₂.

18. (Restated) The glycopeptide of claim 14 wherein R⁵ is a group of the formula -(CH(R²¹)-N(R^c)-R^a-P(O)(OH)₂; wherein R²¹ is hydrogen or R^d.

19. (Amended) The glycopeptide of claim 14 wherein R²⁰ is -CH₂CH₂-NH-(CH₂)₉CH₃;
-CH₂CH₂CH₂-NH-(CH₂)₈CH₃; -CH₂CH₂CH₂CH₂-NH-(CH₂)₇CH₃;
-CH₂CH₂-NHSO₂-(CH₂)₉CH₃; -CH₂CH₂-NHSO₂-(CH₂)₁₁CH₃; -CH₂CH₂-S-(CH₂)₈CH₃;
-CH₂CH₂-S-(CH₂)₉CH₃; -CH₂CH₂-S-(CH₂)₁₀CH₃; -CH₂CH₂CH₂-S-(CH₂)₈CH₃;
-CH₂CH₂CH₂-S-(CH₂)₉CH₃; -CH₂CH₂CH₂-S-(CH₂)₃-CH=CH-(CH₂)₄CH₃ (*trans*);
-CH₂CH₂CH₂CH₂-S-(CH₂)₇CH₃; -CH₂CH₂-S(O)-(CH₂)₉CH₃; -CH₂CH₂-S-(CH₂)₆Ph;
-CH₂CH₂-S-(CH₂)₈Ph; -CH₂CH₂CH₂-S-(CH₂)₈Ph; -CH₂CH₂-NH-CH₂-4-(4-Cl-Ph)-Ph;
-CH₂CH₂-NH-CH₂-4-[4-(CH₃)₂CHCH₂-]-Ph; -CH₂CH₂-NH-CH₂-4-(4-CF₃-Ph)-Ph;
-CH₂CH₂-S-CH₂-4-(4-Cl-Ph)-Ph; -CH₂CH₂-S(O)-CH₂-4-(4-Cl-Ph)-Ph;
-CH₂CH₂CH₂-S-CH₂-4-(4-Cl-Ph)-Ph; -CH₂CH₂CH₂-S(O)-CH₂-4-(4-Cl-Ph)-Ph;
-CH₂CH₂CH₂-S-CH₂-4-(3,4-di-Cl-PhCH₂O-)-Ph; -CH₂CH₂-NHSO₂-CH₂-4-[4-(4-Ph)-Ph]-
Ph; -CH₂CH₂CH₂-NHSO₂-CH₂-4-(4-Cl-Ph)-Ph; -CH₂CH₂CH₂-NHSO₂-CH₂-4-(Ph-
C≡C-)-Ph; -CH₂CH₂CH₂-NHSO₂-4-(4-Cl-Ph)-Ph; or -CH₂CH₂CH₂-NHSO₂-4-(naphth-2-

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 9

yl)-Ph.

20. (Restated) The glycopeptide of claim 14 wherein R³ is -OH; R⁵ is N-(phosphonomethyl)aminomethyl; R¹⁹ is hydrogen, and R²⁰ is -CH₂CH₂-NH-(CH₂)₉CH₃; or a pharmaceutically acceptable salt thereof.
21. (Restated) The glycopeptide of claim 14 wherein R³ is -OH; R⁵ is N-(phosphonomethyl)aminomethyl; R¹⁹ is hydrogen, and R²⁰ is -CH₂CH₂-NH-(CH₂)₉CH₃.
22. (Restated) The glycopeptide of claim 20 which is the hydrochloride salt.
23. (Restated) A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a glycopeptide of any one of claims 1, 5, 14, and 20.
24. (Restated) The pharmaceutical composition of Claim 23, which comprises a cyclodextrin.
25. (Restated) The composition of claim 24 wherein the cyclodextrin is hydroxypropyl- β -cyclodextrin.
26. (Restated) The composition of claim 25 which comprises from about 250 mg to about 1000 mg of the glycopeptide and from about 250 mg to about 10 g hydroxypropyl- β -cyclodextrin.
27. (Restated) The composition of claim 26 wherein the weight ratio of hydroxypropyl- β -cyclodextrin to the glycopeptide is from about 1:1 to about 10:1 inclusive.
28. (Amended) A method for preparing a glycopeptide of claim 2, comprising

U.S. Serial No. 09/847,042
Attorney Docket No. P-088-R
Page 10

derivatizing a corresponding starting glycopeptide wherein the carboxy-terminus is a carboxy group.

29. (Amended) A method for preparing a glycopeptide of claim 3, comprising derivatizing a corresponding starting glycopeptide wherein the 2-position of the 1,3-dihydroxyphenyl moiety is unsubstituted.

30. (Restated) A method of treating a mammal having a bacterial disease, the method comprising administering to the mammal a therapeutically effective amount of a glycopeptide of any one of claims 1, 5, 14, or 20.

31. (Amended) A method of treating a mammal having a bacterial disease, the method comprising administering to the mammal a therapeutically effective amount of a pharmaceutical composition of claim 23.